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## Tradition of Rationalist Medicine in Ancient India

### CASE FOR A CRITICAL ANALYSIS OF THE *CARAKA-SAMHITĀ*

The form in which the source-books of ancient Indian medicine reach us, is, to say the least, most queer. It is the form of a strange amalgam of science and its opposite, or more specifically, of natural science and regimented religion. In spite of this peculiarity of the medical compilations in their extant versions it is possible to identify the hard core of natural science in these, on which were imposed—evidently later—an assorted heap of religious ideas and attitudes.

To begin with, let us note some examples of the flat inconsistencies as found particularly in the *Caraka-saṃhitā*. The inconsistencies are both theoretical and practical. I shall choose some examples of the latter, because heated controversies are still going on in India about these.

In full conformity with what is called the orthodox view of life, the text expresses great religious reverence for the cow. But it also shows a frankly medical interest in the animal, prescribing its flesh as diet or drug. In short, it wants people to worship the cow as well as to eat it to satisfy the purely physical requirements.

Nothing is more pleasing than the former for the orthodox religious sentiment. However, though most revolting for the same, the latter also remains embodied in the same text

obviously as a feature of the medical conscience. Many times the *Caraka-saṃhitā* recommends the worship of the cow.<sup>1</sup>

In this the text is acceptable to the Brahmins who propagate the view that the cow is as holy as they are themselves. Strangely, however, the same text also shows a clearly medical interest in the same animal, i.e. an interest in its flesh etc. from the therapeutic point of view.

In Chapter 27 of the *Sūtra-sthāna*, the cow is found no longer in the venerable company of the gods and Brahmins, but where it actually belongs according to the general zoological understanding of the text. It is the class of animals called *prasaha*, i.e. those that grab and tear off their food. To this class belong twenty-nine varieties of animals—cow, ass, mule, camel, horse, panther, lion, bear, monkey, wolf, tiger, hyena, dog, crow, eagle, vulture, etc.<sup>2</sup> The main theme of this chapter is dietetics, from the point of view of which it mentions the flesh of all these animals and also of a large variety of other animals belonging to other classes. The food value of the cow's flesh is discussed in this chapter in two forms. First, as the general food value of the general class of animals to which the cow belongs. Secondly, as the specific food value of the specific variety of animal, though belonging to a general class.

The flesh of animals belonging to the five general classes called *prasaha*, *bhūmiśaya*, *anūpa*, *vāriśaya* and *ambucārin* "are heavy, hot, unctuous, sweet and promotive of strength and plumpness. They are aphrodisiac and highly curative of *vāyu* and great provokers of *kapha* and *pitta*. They are wholesome to those who take daily exercise and whose digestive fire is strong."<sup>3</sup> Thus the flesh of the cow, as an animal belonging to the *prasaha* class, is understood to have certain general food values also possessed by other animals belonging to the same class—say, the ass, mule, camel, horse, monkey, vulture, owl, and so on.

But all this is not to be misunderstood. To the five broad classes of animals just mentioned belong ninety varieties of animals. The text is not so naive as to suggest that the flesh

of all these animals have the same or identical food value. What is just quoted simply means that the flesh of all these animals have some very broad qualities in common. But the text immediately adds that it is not enough for the physician's purpose to know only these general qualities.<sup>4</sup>

What, then, are the specific qualities of the cow's flesh? Ātreya answers: "The flesh of the cow is beneficial for those suffering from loss of flesh due to disorders caused by an excess of *vāyu*, rhinitis, irregular fever, dry cough, fatigue, and also in cases of excessive appetite resulting from hard manual work."<sup>5</sup>

For patients suffering from emaciation due to pectoral lesions is recommended barley-meal with either the milk or meat-juice of the cow, buffalo, horse, elephant, and goat.<sup>6</sup> Some diseases are viewed as due to the excess of *vāyu* in the body and since the cow's flesh is considered greatly beneficial in disorders due to excess of *vāyu*, the meat-juice of the cow—like that of various other animals—is recommended as a cure for these.<sup>7</sup>

Since persons suffering from consumption are badly in need of adding flesh to their bodies and since the physicians think that the cow's flesh—like that of the other animals belonging to the *prasaha* class—is promotive of flesh and plumpness, they freely recommend it for the consumptive patients, along with a number of alternatives to it.<sup>8</sup>

To say all this in ancient India is risky. There is a strong religious sentiment for the cow, and hence also a strong religious taboo against beef-eating. The origin of these may form the subject of serious socio-historical investigation. But the risk faced by the physicians is obvious. For the purpose of ruling the people effectively, the law-givers and statesmen found a cluster of superstitions extremely useful, which therefore they wanted systematically to enforce. The religious reverence for the cows and Brahmins belongs to this cluster. Here is how Kane compiles some of the evidences for this: "Manu xi. 79 says that if one sacrifices one's life in defence of *Brāhmaṇas* and cows, one becomes free from the sin of even

*Brāhmaṇa* murder. Viṣṇu xvi. 18 declares that even an untouchable (*bāhya*) went to heaven by giving his life in defence of *Brāhmaṇas*, cows, women, children. . ."<sup>9</sup>

Thus notwithstanding the systematic effort of the law-givers and politicians to boost veneration for the cow—to declare that slaughtering the cow is a sin causing the loss of caste<sup>10</sup> and therefore demanding a prolonged penance<sup>11</sup>—the genuine physicians in our medical compilation appear to remain unconcerned. What interests them is a different point altogether. It is only the food-value of the cow's flesh, like that of the flesh of various other animals, for they think that the most important factor determining health is food.<sup>12</sup>

In such a view of food, there is obviously no scope for the intrusion of any religious or extra-medical consideration.

The physician's view of food is summed up in a recapitulatory verse: "The body is the product of food, the disease is born of food, the distinction of happiness and sorrow resulting from the distinction of wholesome and unwholesome diet..."<sup>13</sup>

To assume the appearance of extreme piety, the text even goes to the extent of asserting that those with medical knowledge proper declare celibacy as the best road leading to liberation.<sup>14</sup>

Still the question is: Can one with real medical knowledge actually declare this? Or, is it one among hundreds of concessions to the counter-ideology in the extant *Caraka-saṃhitā*—concessions with which the ancient doctors try somehow to save their science from the continuous condemnation of it by the law-givers?<sup>15</sup>

Two absolute preconditions for the observance of celibacy are, as explained by the law-codes, total abstention from sex and alcohol. Of these two let us discuss here the latter.<sup>16</sup>

As a matter of fact, the question of celibacy apart, the Indian law-givers express very strong disapproval for alcoholic drinks as such.<sup>17</sup>

To the genuine physicians of the *Caraka-saṃhitā* any absolute view of the desirability or otherwise of alcohol is

impermissible, because real medical knowledge allows no absolute view of any substance. Hence they declare:

“Wine is prepared from various substances and possesses various qualities. It has various actions on the body. It is intoxicating in nature. Hence it should be viewed from the point of view of both its good as well as evil effects.... If a person takes it in right manner, in right dose, in right time and along with wholesome food, in keeping with his vitality and with a cheerful mind, to him wine is like ambrosia. While to a person who drinks whatever kind comes in hand to him and whenever he gets an opportunity and whose body is dry on account of constant exertion, this very wine acts as a poison.”<sup>18</sup>

Following their dialectical approach, therefore, they proceed to explain some detail of their understanding of alcohol. This discussion of the *Caraka-saṃhitā* seems to retain interest even for our times. We quote it at some length:

“Three stages of intoxication are observed in a person who drinks wine: the first the middle or the second, and the last or the third. We shall describe the characteristics of each of them. It promotes exhilaration, delight, a finer discrimination of the qualities of food and drink, desire for music, songs, jokes, and stories. It does not impair the intellect or memory, and causes no incapacity for sense-pleasures. It promotes sound sleep as well as happy awakening. This is the first or happy stage of alcoholic effects.

Fitful recollection, fitful forgetfulness, frequent indistinct, thick and larynged speech, indiscriminate talk, unsteady gait, impropriety in sitting, drinking, eating and conversation—these are to be known as the symptoms of the second stage of alcoholic effects.

After transcending the second stage and before reaching the last stage, there is no impropriety which persons of *rājasic* and *tāmasic* nature will not commit.

Having reached the third stage of intoxication, he becomes paralysed like a felled tree with his mind submerged

in intoxication and stupor, and though alive resembles a dead man.

...On account of his addiction, he is condemned and censured by all people and is regarded an unworthy man by them, and he later on develops painful diseases as a result of his addiction."<sup>19</sup>

The *Caraka-saṃhitā* is indeed very keenly aware of the undesirable consequences of excessive drinking. It prescribes certain remedies for alcoholism, inclusive of the controlled use of alcohol itself,<sup>20</sup> and—reckless again to the orthodox ethico religious norm—"the aid of affectionate embraces of women's bodies full of the warmth of youth, the warm clasp of their waist, thighs and full grown breasts."<sup>21</sup> What is remarkable about the physicians, however, is that they refuse to judge alcohol by the alcoholic behaviour or the intrinsic nature of the drinks by the consequences of morbid drinking. On this point, the *Caraka-saṃhitā* sums up its attitude as follows: "But wine, by nature, is regarded similar to food in its effects. It is productive of disease if taken in an improper manner, and is like ambrosia if taken in a proper manner..."<sup>22</sup>

More examples of flat contradictions in practical precepts are not necessary, though it is important to remember that the extant *Caraka-saṃhitā* is full of examples of similar contradictions in basic theoretical attitudes also.<sup>23</sup> Which of the two contradictory attitudes and ideas embodied in the *Caraka-saṃhitā* represents the standpoint of the hard scientific core of ancient Indian medicine? Before trying to answer this, let us first note some of the rather well-known facts about this compilation and about the history of its formation.

The *Caraka-saṃhitā* is an enormous medical compilation, parts of which are entirely in verse, parts in prose alternating with verse, parts simply in prose usually concluding with mnemonic verses. Its language, as Filliozat says, "is classical and does not correspond to a definite epoch."<sup>24</sup> On a rough calculation, it is about three times in bulk of what survives as the medical literature of ancient Greece, the so-called Hippocratic corpus.

A great deal of rigour is not maintained in the arrangement of the main subjects discussed in the eight books of the text. The text as a whole is full of repetitions and digressions. It also describes debates and disputes among various authorities on questions of basic theoretical importance and what is highly interesting, the text insists that such debates are extremely useful for expanding the mental horizon of the doctors.<sup>25</sup> In any case, the *Caraka-saṃhitā* is fully aware of the differences of opinion among practising doctors and even tells us of the works of different medical schools having been in circulation.<sup>26</sup> Though it is not easy for us to guess today what precisely is being referred to by these, there is no doubt that the *Caraka-saṃhitā* wants to specify certain conclusions as characteristic of the medical school different from the other medical schools having conclusions characteristic of their own. What is remarkable, however, is that, in spite of the awareness of the differences among the different schools of medicine, the text insists that there are certain conclusions essential for medical science as such. In other words, there are propositions which—instead of being characteristic only of this or that school of medicine—are necessarily shared by all schools of medicine. These constitute the absolutely minimum body of postulates without which medicine is not at all possible. The text calls these *sarva-tantra-siddhānta* or conclusions unanimously shared by all schools of medicine, and says:

“Among these (conclusions) those are called the unanimously admitted ones which have a reputation in each and every treatise on the subject (viz. medicine). Such are: there are causes; there are diseases; there are ways of curing the curable diseases”.<sup>27</sup>

That means there are three minimum propositions for medical science as such. These are: 1. the principle of causality, 2. the recognition of the fact of disease, which seems to mean the acceptance of disease *as* a disease rather than any supernatural phenomenon and 3. the self-assurance of

the doctor that there must be techniques of actually curing the disease coming under those that are not incurable.

It is appropriate here to note some points about the formation of the *Caraka-saṃhitā*.

As for its possible date, modern scholars have proposed various views. These range from the sixth century B.C. or much earlier to the first century A.D. or much later. I have elsewhere tried to show that though any tendency at absolute dating of the text is bound to be fallacious, there are important evidences suggesting what Filliozat calls "the epoch of the creation of the doctrine contained therein" being very likely to be pre-Buddha.<sup>28</sup>

In any case, the medical tradition embodied in the text is admittedly ancient. But the only form in which it reaches us is quite later. It is not improbable that the *Caraka-saṃhitā* retains in its own way the memory of the earliest theoretician of the medical school.

It is hard to believe that the vast compilation with all its inner complexities is based on the oral instructions of a single person codified by only one of his students. The simple fact on the contrary seems to be that besides many religious and metaphysical elements introduced in course of time it contains the total pool of medical knowledge of a considerable number of ancient doctors and, what is also most important for our understanding of it, it passes through various hands before reaching us in its present form.

For understanding the history of Indian science it is as important to identify what are alien additions to the text as to see what survives as positive achievements of ancient Indian medicine.

But what is the criterion on the basis of which we can possibly identify the scientific core of the *Caraka-saṃhitā* and the alien ideas superimposed on it? Fortunately, we need not go outside the compilation for determining it.

To begin with, let us recall the account of a medical colloquium we have in the text. In this, Vāryovida expounds an anthropomorphic view of wind as the ultimate principle



governing everything. But another medical authority, Marīci, leaps to the attack: "Even if all these were true, what is the point in saying or knowing these in the medical discipline? Whatever is said here must be said strictly in accordance with the requirements of medicine."<sup>29</sup> Thus, in short, what interests the physician is medicine and medicine alone.

We have in this bold protest of Marīci against Vāryovida's metaphysics a formulation of the criterion by which to judge what is intrinsic and what is extrinsic to medical science in our extant medical compilations.

One peculiarity of the *Caraka-saṃhitā* as already noted, is that it is aware of considerable differences of opinion among different medical authorities. It also mentions theoretical conclusions characteristic of the other systems of medicine, i.e. differing from the one supposed to be codified in the text.

We are told: "Among the people are current various treatises on medicine". Hence, after making up the mind for going in for medical studies, one has first of all to select the right treatise for oneself. Thus is the need felt for describing the model medical treatise. For our present purpose, the most relevant point about this model is that a medical treatise must confine itself exclusively to topics having strict relevance for medical science, that it must not contain anything extrinsic to or irrelevant for its subject matter, or as the text puts it, it must not mix up (*asaṃkula*) its actual theme with anything else.<sup>30</sup>

This chapter of the *Caraka-saṃhitā* which formulates the model of medical treatise, finds it necessary to go also into much detail on the methodology of medical discussion. In the course of this, it explains certain fallacies resulting from the violation of the norm of right discussion.

The physician is interested only in safeguarding the integrity of his science. For this purpose, he is formulating the general rule that in medical science no proposition is to be allowed which does not belong to the strictly medical context.

Still, the way in which the fallacy of contradiction resulting from the confusion of contexts, as illustrated in the text, has its own interest. It is the way in which the physician is trying to defend the integrity of his science against the possible intrusion of it by the counter-ideology. No proposition belonging to the context of *yajña* and that of *mokṣa* is to be allowed in medicine. To resist the invasion of medical science by Vedic orthodoxy, the physicians require the general rule of excluding the possible confusion of contexts. Thus the way in which the physicians illustrate this amounts to the assertion that, for the sake of self-consistency, medical science has to avoid Vedic orthodoxy as a whole. Significantly, apart from the context of strict medical science, the text speaks only of two other contexts—the ritual context and liberation-context, i.e. *karma-kāṇḍa* and *jñānakāṇḍa*. Propositions belonging to either of these two is not to be allowed in medicine.

The physicians seem to reiterate the dictum, in the course of which they find it necessary also to come out with a defence of the essentially rationalist attitude. "The propositions and counter propositions on all the topics covered by it are to be clearly and cogently worked out. Every statement made must be based on a clear and careful understanding of these. Medical discussion is to allow no proposition which is irrelevant, unauthoritative, uninvestigated, without any practical significance (*asādhaka*), confused and without a general applicability (*avyāpaka*). Every proposition must be substantiated by reason (*sarvaṃ hetumat brūyāt*). Only those propositions that are substantiated by reason and are untainted by any other consideration, prove useful for therapeutic purposes, because such propositions alone help the intellect to be broadened and only uninhibited intellect to the successful culmination of an undertaking."<sup>31</sup>

What exactly is the nature of their own specific context—that of the medical science—the integrity of which the physicians want to preserve and therefore the possible confusion of which with anything else they want to avoid?

This is briefly answered: there are four and only four factors on which medicine depends. This view of medicine as depending on four factors retains considerable importance in the *Caraka-saṃhitā*. In the Āyurvedic view, successful medical treatment depends on four factors. These are: the physician, substances (drugs or diets), nurse and patient. Accordingly, a chapter of the *Caraka-saṃhitā* is designed to explain these four factors, or more properly, the desirable qualities or qualifications of each of these four, the combined operation of which leads to therapeutic success. The text mentions in this connection four such qualities of each of these four factors. We quote these not only to see how remarkably free the medical view is from supernaturalism and scriptural cant but moreover because some of the things said by the ancient doctors retain profound significance even for our times.

The four essential qualifications of the physician are: 1. clear grasp of the theoretical content of the science, 2. a wide range of experience, 3. practical skill, and 4. cleanliness.<sup>32</sup>

The four essential qualities of the drugs or substances are: 1. abundance, 2. applicability, 3. multiple use (or, what is perhaps called "broad spectrum" in modern medical jargon) and 4. richness in efficacy.<sup>33</sup>

The four essential qualifications of the nursing attendant are: 1. knowledge of the nursing technique, 2. practical skill, 3. attachment for the patient, and 4. cleanliness.<sup>34</sup>

The four essential qualifications of the patient are: 1. good memory, 2. obedience to the instructions (of the doctor), 3. courage, and 4. ability to describe the symptoms.<sup>35</sup>

Something is so striking about this enumeration of the qualities of the "four factors" ensuring medical success that it is impossible for us to overlook it. While enumerating the desirable qualities of the patient, the medical compilation is absolutely silent about the accumulated merits of his past actions contributing to his recovery. In other words, it is totally silent about *Karman* and *adrṣṭa*. How are we to account for this silence? Could it be that the ancient physicians were

unaware of the importance attached to this view in the officially boosted world-outlook of ancient India? It is obviously impossible to take such a possibility seriously. Could it then be that the doctors believed in *karman* and yet forgot to mention it in this context? This again is inconceivable, because the discussion of the merits of the patient is about the surest context of mentioning the *adr̥ṣṭa* of the patient on the part of those who believed in it. The silence of the *Caraka-saṃhitā* about *karman* and *adr̥ṣṭa* of the patient, even in this context of discussing the qualities essential for his recovery, can thus have only one significance for us. From the medical viewpoint, *karman* is considered a redundant hypothesis. So the physicians prefer to ignore it altogether. They have far more serious things to discuss instead, namely the real merits of the patient really contributing to his recovery. The ancient doctors lived in a world in which the law-givers declared that any indifference to the law of *karman*—which this assertion obviously entails—is nothing short of heresy. The ancient Indian doctors, however, cannot help this. Their science and the law of *karman* do not go together. This becomes all the more obvious when they defend the intrinsic efficacy of medical science.

The fact is that in spite of receiving medical treatment characterised by these four factors a patient is often found to die, just as a patient is often found to be cured in spite of the absence of these four factors.

There is a theory widely circulated in ancient India with the powerful backing of the priests and law-givers according to which both recovery and death are being determined by some omnipotent law other than the one the physicians speak of. That is the law of *karman*. While answering the objection raised against the efficacy of medical science, the physicians do in fact completely ignore the law of *karman*. They seem to brush aside the officially boosted view that life and death, health and disease—in fact all that a man enjoys or suffers—are being determined by the “unseen” hangovers of actions performed by him in his past life. They argue, on the contrary,

that the knowledge and technique which they represented have by themselves the efficacy of ensuring long life, of effecting actual cure.

Not that they make the absurd claim that they can cure all diseases. Like the modern doctors the ancient doctors are also aware of the fact that medicine notwithstanding, certain diseases remain incurable, though of course the range of incurable diseases for them is much wider than it is for the modern doctors. But they very strongly assert that a right doctor rightly applying the therapeutic technique can never fail to cure a curable disease. It is not enough to observe whether a patient gets cured by medical treatment or not. It is essential to note moreover the nature of the disease he suffers from. If the disease is incurable by nature, the patient dies in spite of full medical care, or, according to the Āyurvedic way of putting it, in spite of all the four factors of medicine along with their sixteen qualities being present. But this cannot be true when the disease is a curable one.<sup>36</sup>

The physicians of the *Caraka-saṃhitā* feel that the vast empirical data before them help them to develop insight into certain laws of nature, which rightly followed enable the doctors to cure the curable diseases without fail. What makes the medical technique infallible is that it is based on some well-defined principles justified by empirical data: "We follow the following principles because all these are well-established by our direct observation. We cure the sick by sickness-removing drugs, the emaciated persons with nourishment, just as we prescribe restrictions of food for the flabby and fat persons. We treat with 'cold' those who are afflicted with 'hot' and with 'hot' those who are afflicted with 'cold'. When some body-element becomes diminished we prescribe for its increment, just as when some body-element becomes excessive we prescribe for its diminution."<sup>37</sup>

But what about the incurable diseases? The *Caraka-saṃhitā* says, "The incurable diseases also fall into two categories: those that respond to palliatives and those that are not even so."<sup>38</sup>

Something really remarkable about this is not to be overlooked. It is the claim that even in some cases of incurable disease, the doctors can prescribe effective palliatives, and thereby relieve the patients of the inevitability of suffering caused by the diseases. Is this not another way of disowning the law of *karman*, according to which—like the disease itself—the suffering caused by it is completely determined by the bad actions performed in the past?

It remains for us to discuss another point in this connection. The objection raised against the intrinsic efficacy of medicine is based on two main grounds. First, patients are observed to die in spite of receiving full medical treatment. Secondly, patients are found to recover even without any medical treatment. We have seen how, in refutation of the first ground, the *Caraka-saṃhitā* insists on determining the nature of the disease. But what about the second ground of the objection? The text says, "And, again, as regards those who recover without the aid of any treatment—even in their case there is a special reason for giving them a complete course of treatment. Just as a man, by lifting another who has fallen—although the latter is able to rise by himself—gives him support, in consequence of which he rises sooner and without difficulty; in like manner do patients receiving the aid of a complete treatment recover more easily and without difficulty."<sup>39</sup>

Thus the ancient doctors do not deny the natural power of the organism helping it to get cured of certain diseases, though their actual knowledge of this natural endowment of the body—compared to that of the modern doctors—is understandably limited. But medicine ensures quicker and surer recovery even for those that may eventually get cured by the natural endowment of the body.

To sum up the discussion: Anything found in the extant *Caraka-saṃhitā* not discussing the four factors essential for medicine—specially the ideas and attitudes belonging to the contexts of ritual performance and of liberation—is to be considered as "irrelevant" for medical science and, as a matter

of fact, in flat contradiction to the genuine scientific core of the work. If we depend on this criterion, we can easily see how much of the extant *Caraka saṃhitā*—the tedious discussions contained in it on soul, rebirth, *mokṣa* and all the theoretical correlates of such ideas—have to be scrapped for our real understanding of the tradition of ancient Indian medicine.

## REFERENCES

1. Caraka-saṃhitā, Gulabkunverva edition, Jamnagar 1949; see, e.g. I.18.18; I.8. 25; II. 7.11; III.3.7; III.8.13; V.12.71; V.12.18; VI.14.23; VI.9.94; VII.1.10.
2. I.27.35–37.
3. I.27.56–58.
4. I.27.63–64.
5. I.27.79–80.
6. VI.1.183.
7. VI.14.126–127.
8. VI.8.158.
9. Kane, *History of Dharmaśāstra* II, 775.
10. Manu XI. 60.
11. Manu XI. 109–117.
12. I.25.36.
13. I.28.45.
14. I.30.15.
15. Āpastamba I.6.19.14; Gautama XVII.17; Vasiṣṭha. XIV.1–10; Manu IV.220; Viṣṇu LXXI.66; etc. etc.
16. See Kane II, 796.
17. Gautama II.25; Āpastamba 1.7.21.8; Vasiṣṭha.I.20; Manu XI 54; Viṣṇu XXXV.1.
18. VI.24.26–28.
19. VI.24.41–51.
20. VI.24.113.
21. VI.24.134.
22. VI.24.59–67.
23. Chattopadhyaya, *Science and Society in Ancient India* 372ff.
24. Filliozat, *Classical Doctrine of Indian Medicine* 50.
25. III.8.15.
26. III.8.3.
27. III.8.37.

28. The crucial evidence for this seems to be the long section on *bheṣajjaka* in *Mahāvagga* of the *Vinaya-piṭaka*, the whole of which presupposes the *yukti-vyapāśraya bheṣaja* or "rationalist therapeutics" of the *Caraka-saṃhitā*.
29. I.12.9.
30. III.8.3.
31. III.8.67.
32. I.9.6.
33. I.9.7.
34. I.9.8.
35. I.9.9.
36. I.10.5.
37. I.10.6.
38. I.10.9.
39. I.10.5.